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ance Notes on Codes and Abbreviations" appearing at the begin-  
ning of each regular issue of the PCT Gazette.

(54) Title: MULTI-COMPONENT VACCINE TO PROTECT AGAINST DISEASE CAUSED BY *HAEMOPHILUS INFLUENZAE*  
AND *MORAXELLA CATARRHALIS*

(57) Abstract: A multi-valent immunogenic composition confers protection on an immunized host against infection caused by both *Haemophilus influenzae* and *Moraxella catarrhalis*. Such composition comprises at least four antigens comprising at least one anti-  
gen from *Haemophilus influenzae*, and at least one antigen from *Moraxella catarrhalis*. Three of the antigens are adhesins. High  
molecular weight (HMW) proteins and *Haemophilus influenzae* adhesin (Hia) proteins of non-typeable *Haemophilus* and a 200 kDa  
outer membrane protein of *Moraxella catarrhalis* comprise the adhesin components while the other antigen is a non-proteolytic  
analog of Hin47 protein. Each component does not impair the immunogenicity of the others. The multi-valent immunogenic com-  
position may be combined with DTP component vaccines, which may also include non-virulent poliovirus and PRP-T, to provide a  
component vaccine without impairment of the immunogenic properties of the other antigens.

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## INTERNATIONAL SEARCH REPORT

National Application No

PCT/CA 00/00811

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 A61K39/116 A61P31/04 //(A61K39/116,39:104,39:102)

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, BIOSIS, MEDLINE, EMBASE

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 96 34960 A (CONNAUGHT LABORATORIES LIMITED) 7 November 1996 (1996-11-07) cited in the application the whole document	1-29
A	BARENKAMP S J ET AL: "IDENTIFICATION OF A SECOND FAMILY OF HIGH-MOLECULAR-WEIGHT ADHESIONPROTEINS EXPRESSED BY NON-TYPABLE HAEMOPHILUS INFLUENZAE" MICROBIOLOGICAL SCIENCES, BLACKWELL SCIENTIFIC PUBLICATIONS, EDINBURGH, GB, vol. 19, no. 6, 1996, pages 1215-1223, XP000946619 ISSN: 0265-1351 cited in the application the whole document -/-	1-29

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \*Z\* document member of the same patent family

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## INTERNATIONAL SEARCH REPORT

Intern  
CA 00/00811

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 94 21290 A (BRENKAMP S. ET AL.) 29 September 1994 (1994-09-29) the whole document	1-29
A	BARENKAMP S J: "Immunization with High-Molecular-Weight adhesion proteins of nontypeable Haemophilus influenzae modifies experimental otitis media in chinchillas" INFECTION AND IMMUNITY, AMERICAN SOCIETY FOR MICROBIOLOGY, WASHINGTON, US, vol. 64, no. 4, April 1996 (1996-04), pages 1246-1251, XP002133637 ISSN: 0019-9567 cited in the application the whole document	1-29
P, A	WO 00 35477 A (CONNAUGHT LABORATORIES LIMITED) 22 June 2000 (2000-06-22) the whole document	1-29

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/CA 00/00811

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9634960	A	07-11-1996	US 5808024 A	15-09-1998
			AU 722132 B	20-07-2000
			AU 5394196 A	21-11-1996
			CA 2219889 A	07-11-1996
			EP 0826052 A	04-03-1998
			JP 11502415 T	02-03-1999
WO 9421290	A	29-09-1994	AU 696207 B	03-09-1998
			AU 6400594 A	11-10-1994
			BR 9406589 A	30-01-1996
			EP 0689453 A	03-01-1996
			JP 11501003 T	26-01-1999
			US 5869065 A	09-02-1999
WO 0035477	A	22-06-2000	AU 1543900 A	03-07-2000